EASTERN CRANE BULLETIN

September 2021

The Eastern Crane E-bulletin covers news about the Eastern Populations of Sandhill and Whooping Cranes, as well as general information about cranes and the continuing work for the protection of these birds and their habitats.

Pair of Whooping Crane twins (cinnamon-colored juveniles) with parents. Photo by John McKinnon/Parks Canada, 2017

Editor: *During much of the Whooping Crane's history in North America, seemingly unsurmountable obstacles have threatened the species' existence: natural disasters such as hurricanes, drought, and fires, and man-made woes such as over-hunting, the draining of wetlands and clearing of prairies for agriculture; telecommunication towers and powerlines; windmills; pollution of coastal waters from oil spills; and loss of habitat due to development and water-diversion projects. Despite all this, Whooping Cranes have shown great resilience and carried on. But now the accelerating pace of climate change is creating new concerns for those working to keep Whooping Cranes on the landscape. Scientific research documents the threats posed to cranes. Drought – on the breeding grounds, along the migratory corridor, and on the wintering grounds – may tip the scales against survival of the Whoopers.*

Special thanks to Brian W. Johns, Canadian Whooping Crane Coordinator Canadian Wildlife Service (Retired), and Tom Stehn, U.S. Whooping Crane Coordinator U.S. Fish and Wildlife Service Aransas National Wildlife Refuge (Retired), for their support in finding research for this issue of the Eastern Crane Bulletin.

Widespread drought, fires, and smoke plague western U.S. and Canada

The following are excerpts from: *Chavez-Ramirez and Wehtje, 2011*

The Whooping Crane's small population size, limited distribution, wetland habitat requirements, and twice yearly 2,500-mile migration route make them particularly vulnerable to changes in habitat conditions in either breeding grounds, wintering areas, or throughout the migratory corridor. The species will be exposed to significant alterations in its habitat conditions in all areas of its life cycle. Research shows that climate changes impacting the quantity, timing, and intensity of precipitation events could have significant impacts on the habitat availability and wetland food resources for Whooping Cranes as life cycles and development of most items in Whooping Crane diets—crustaceans, aquatic invertebrates, and vertebrates—are significantly influenced by temperature, freshwater conditions, and salinity levels.

Equally detrimental is an increase in precipitation and more extreme rainfall "events" that could impact chick survival if the rainfall occurs during hatching. Heavy rainfall during hatching or first weeks after hatch could lead to chicks drowning or succumbing to health problems. Increased precipitation may also alter fire regimes leading to increased woody plant abundance thus reducing nesting habitat quality. Stopover wetland availability during migration may decrease due to drier conditions in the Great Plains.

On the Wood Buffalo National Park breeding grounds

The following are paraphrased excerpts from: *Kuyt, Barry and Johns, 1992*

Correct water depths in the breeding range are of critical importance. Whooping Cranes select shallow ponds, islands and marshes as nesting areas and use emergent wetland vegetation such as bulrush, sedge, and cattail as nest material. During spring and summer, the cranes forage almost exclusively in wetlands, particularly along the margins of shallow ponds, where larval and nymphal forms of insects may occur, as well as leeches, snails, small fish, and frogs. With decreased water levels, pond margins become exposed, revealing foraging cranes and their flightless chicks; the birds' feeding opportunities decline, frequently forcing them to travel overland to the next pond and exposing themselves to terrestrial predators.

Water levels in nest ponds in 1990 were the lowest since 1980. A dry spring around Fort Smith was then followed by one of the wettest Junes on record (rain on 16 days), followed by 15 days of rain in July. June and July precipitation figures were respectively 4.5" and 3.4". Although Wood Buffalo NP was lush green in the summer of 1991 and provided good cover for young cranes, the rains may have come too late to allow invertebrate food stocks to increase in time. The almost continuous rains for much of June and July may have disrupted crane feeding, thus increasing mortality of small chicks.

The peak 1990-1991 wintering population of 146 birds at Aransas suffered severe losses. Eleven birds including five of the 13 juveniles and at least three adults from different breeding pairs died. Biologists assumed that unfavorable habitat conditions in spring discouraged many experienced and novice breeders from nesting in 1991.

Wildfires, caused primarily by lightning, are generally thought to have beneficial effects on crane habitat by recycling nutrients and removing and thinning vegetation on the forested ridges between nesting ponds, making the area more accessible to cranes. Fires have burned large portions of the nesting area during drought *(e.g., 1981).* Although molting adults or flightless young are vulnerable to fire, losses of eggs, chicks, or adults have not been confirmed. *(USFWS Whooping Crane Recovery Plan)*

The following are excerpts from: *Johns and Craig-Moore,* Smoke and Cranes*, 2004*

The lack of rainfall since April was starting to take its toll on the wetlands which were beginning to dry in most areas. The below-normal amounts of rain continued well into August. In fact, the summer of 2004

was the driest in 50 years. Since April, Fort Smith had received only one third of its normal rainfall, and WILDFIRE was the word for the months of July and August. Fire is a natural part of the boreal forest ecosystem and is a way of recycling nutrients by enriching the soil, reducing insect pests and allows for the germination of new seedlings. The fire history of the nesting area does not appear to affect the selection of nest sites by whooping cranes but can play havoc with humans. At one time there were 13 helicopters and 190 people working the fires in Wood Buffalo National Park. Wood Buffalo National Park fire #25 was about 8,300 ha (20,509 acres) in size and burned into crane nesting territories on both its eastern and western flanks.

Fire #3 was almost 91,000 ha (224,770 acres) and burned into the territory of another pair. Fire #21 burned across Highway 5 and had reached about 52,000 hectares (128,440 acres) in size and Fire #50, on the north edge of the Klewi nesting area, grew to 7000 hectares (17,290 acres) in size. In total 193,000 hectares (or 5%) (476,710 acres) of Wood Buffalo National Park burned this summer affecting many of the Whooping Crane nesting areas in and around the park. The highway to Fort Smith was closed several times throughout the summer due to poor visibility caused by excessive smoke. The dry and smoky conditions also made surveying challenging and we had to be in constant radio contact with the fire centre in Fort Smith and all the local air traffic working the fires.

The Klewi was the driest we have ever seen. Despite the fires, half of the 20 pairs in the Klewi had young and survival in Alberta was similar with two of four pairs having young. The best news was that the Sass nesting area only had two failed pairs. In total, we found 41 young, including five pairs with twins (another record).

Dry wetland Sass River area Wood Buffalo National Park. Photo by Brian Johns/Canadian Wildlife Service, 2007

The following are excerpts from: *Johns and Craig-Moore, Fall 2007 WCCA newsletter* Grus Americana

Water levels throughout the Whooping Crane breeding grounds in the northeastern corner of Wood Buffalo National Park and adjacent areas were very poor again during the fall of 2006 and with below-normal snowfall levels reported throughout the winter.

The month of June 2007 had only 5% of normal rainfall and habitat conditions deteriorated throughout the nesting area. Large fires triggered by lightning were burning south of the of Peace Point and Garden

River. Another smaller fire was burning along the Klewi River in the territory of one of the nesting pairs. The lack of rain in June was double-edged – both positive and negative. Positive insofar that recently hatched young were not exposed to cool wet weather and survival in the first few weeks was high. Negative because as the wetlands dry out the area becomes more accessible to predators, therefore reducing the long-term survival rate of the young. Habitat conditions were so bad (*see above photo*) in the Sass River nesting area that most of the wetlands were dry resulting in only 4 of 16 nesting pairs producing young in that area.

Habitat along the U.S. migration corridor

The following are excerpts from: Chavez-Ramirez & Wehtje, 2011

Once Whooping Cranes reach the Canada-U.S. border, the cranes use a 204-mile-wide migration corridor that runs through the central portions of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. During migration, Whooping Cranes migrate during daylight, alighting on wetland areas in late afternoon to dusk where they roost overnight *(Austin and Reichert 2001).* There are no staging grounds in the U.S. that equal the importance of south-central Saskatchewan, but several areas, including the central Platte River in Nebraska, Quivira National Wildlife Refuge (NWR) and Cheyenne Bottoms in Kansas, and the Salt Plains NWR in Oklahoma are used frequently enough that they are designated as Critical Habitat by the U.S. Fish and Wildlife Service *(CWS and USFWS 2007).*

Historically, the central Great Plains consisted of grasslands. The northern tier of states includes portions of the Prairie Pothole Region (PPR), an area of 5-8 million glacially formed wetlands that are filled by winter precipitation and groundwater *(Millett et al. 2009).* These potholes are extremely sensitive to climate variability, during drought years large portions of this region support few if any wetlands with water *(Millett et al. 2009).* Beginning with the Rainwater Basin in south-central Nebraska, playa lakes become the primary wetland type in the southern Great Plains *(Smith 2003).* Less abundant than the potholes of the northern Great Plains, playa wetlands number only in the tens of thousands *(Guthery and Bryant 1982; Smith 2003)*. These intermittent lakes and wetlands are dependent upon precipitation, during drought periods many of them are dry year-round *(Smith 2003).*

In addition, the Great Plains has experienced recurring drought cycles during the last 8,000 years; future droughts are expected and may be exacerbated by climate change *(Clark et al. 2002).* The implications of the Intergovernmental Panel on Climate Change (IPCC) predictions are that Whooping Crane stopover habitat may become less common in the future as so many of the wetlands in the Great Plains are intermittent and dependent upon precipitation *(Smith 2003)*. With so much of the region in private ownership, there are limited opportunities for government agencies to provide wetland habitat for Whooping Cranes and other migratory water birds.

> The NGO Whooping Crane conservation group Friends of the Wild Whoopers (FOTWW) has for years been raising awareness about dwindling stopover habitat along the U.S. portion of the migration corridor and the urgent need to protect it. Loss of stopover wetlands is largely a consequence of intensified farming and prolonged drought. Through partnerships formed by FOTWW, crucial habitat on military bases, Native American Reservations and Army Corp of Engineers lakes will help provide needed stopover habitat for the cranes. To paraphrase Chester McConnell, President of FOTWW, “Whooping Cranes can take care of themselves, but only if we protect them from gunshot and take measures to preserve their habitat” (current issue of the Whooping Crane Conservation Association (WCCA) newsletter, *Grus Americana*).

Although fall and spring migration only span 9 weeks (17%) of the birds’ annual cycle, 60–80% of Whooping Crane mortality occurs during this time *(CWS and USFWS 2007).* There are few documented causes of death during migration, but the collisions with power lines have been identified as a major cause of death for young birds *(Howe 1989; Lewis et al. 1992).* Such collisions are believed to be more common when birds are flying in unfamiliar surroundings during low light conditions, such as after sunset *(CWS and USFWS 2007).* With the predicted decreased rainfall across most of the Great Plains, availability of roosting wetlands could cause increased movement of cranes in lower light conditions leading to greater mortality in migration.

Drought and Winter Habitat

The following are excerpts from: *Stehn,* Comments on SAGES Final Report (5 June 2009)

Whooper with Blue crab. Photo by Tom Fernandes

The productivity and quality of coastal waters in winter Whooping Crane critical habitat at Aransas is directly dependent on freshwater inflows that start hundreds of kilometers inland from the San Antonio / Guadalupe River and flow into coastal waters *(TPWD 1998).* Flows from springs coming from the Edwards Aquifer are also crucial, especially in times of drought when they can make up 70% of Guadalupe River water. Thus, the ongoing reduction of freshwater inflows due to human population growth is a huge threat to the Whooping Crane that could lead to its extinction.

Data collected at Aransas National Wildlife refuge indicates a relationship between marsh salinities, blue crab populations, and Whooping Crane survival. In general, when inflows are high and bay and marsh salinities are low, blue crab populations do well, and Whooping Crane mortality is low. With reduced inflows and high marsh and bay salinities, crabs do poorly and Whooping Crane mortality rises dramatically. Sufficient inflows are required to produce the necessary food for Whooping Cranes to survive. Inflows that carry nutrients and sediments and maintain proper salinity gradients in the estuary are needed to produce blue crabs that are the primary food for Whooping Cranes. Chavez-Ramirez *(1996)* found that when available, blue crabs can make up 80-90% of the diet of Whooping Cranes. An individual crane can consume up to 80 crabs per day. Studies by Nelson *(1995)* of Whooping Crane food items (crabs, clams, wolfberry, acorns) showed that blue crabs were the highest in protein and nutrition for the Whoopers. When crabs are not available, Whooping Cranes will switch to other foods, but because of the poor nutritive value of these alternate foods, the Whoopers may actually burn fat reserves and have a net loss of energy for periods of the winter *(Chavez-Ramirez, 1996*).

Decreased precipitation in the wintering area may lead to increased water salinities in Whooping Crane wetland territories. Whooping Cranes drink brackish marsh water when salinities are below 20 ppt (parts per thousand). If salinities increase and remain >23 ppt, all Whooping Cranes must leave their saltmarsh territories and fly to drink freshwater in upland sources leading to increased energy expenditure and potentially greater predation *(USFWS reports, Stehn pers. observ.).* Most depredation events recorded in reintroduced Whooping Cranes in Florida were related to cranes spending time in uplands away from wetland habitat.

A correlation has been noted between the winters of high Whooping Crane mortality (1988, 1989, 1990, 1993, 2001, 2005, 2008) and low river flows on the Guadalupe below the level of 1.3 million acre-feet recommended by TPWD required for a healthy bay/estuary system *(R. Sass, Professor of Natural Sciences, Emeritus, Rice University, unpublished data).* Dr. Sass came to the following conclusions:

1. A high (Whooping Crane) mortality rate is always accompanied by a low river flow and the resulting high salinity.
2. A Whooping Crane response to low river flow (high salinity) is one of excess stress. This condition does not necessarily lead to death but may be manifested as lack of sufficient bodily fat and protein that will be exhibited during the spring migration and subsequent poor reproductive behavior.

3. Complete and accurate data on environmental stress that is manifested by poor migratory and reproductive behavior is hard to generate but may well be a major part of the story on salinity-diet relationships.

Nelson *(1996*) noted an apparent instance of food shortage contributing to higher Whooping Crane mortality from late fall of 1993 to fall of 1994. This negative energy balance may also have manifested itself in greater than normal over-winter mortality and reduced nesting effort in the subsequent nesting season where 37% of the adult pairs (17 out of 46) failed to nest *(B. Johns, Canadian Wildlife Service, unpublished data).* This was unusual since normally just about all pairs attempt to nest annually. In addition, production was reduced from the pairs that did nest *(B. Johns, Canadian Wildlife Service, personal communication)*. This was believed to have resulted from their reduced fat reserves that had not built up sufficiently during the previous winter. Field sampling shows that blue crab populations usually crash in periods of drought. Examples of this were the winters of 1989, 1993, 2000, 2005 and 2008.

The following are winter notes on habitat conditions during high Whooping Crane flock mortality taken from unpublished file reports written annually by Tom Stehn that appeared in Comments on SAGES Final Report. And from a recent communication with Stehn, "To generalize, Whooping Cranes (and cranes in general) do poorly in drought situations. It was during greatly reduced freshwater river inflows to the Aransas area during the 2008-09 winter when I found mortality of 23 whooping cranes. Presumably food supplies for the wintering cranes were negatively impacted."

1962-63 winter - 4 birds lost, highest as of that date.

1988-89 winter – 6 losses out of 138 (4.3%), the highest ever recorded as of that date.
The winter was notable for the amount of crane use in upland areas and freshwater ponds. Freshwater sources, mostly dugouts, provided sufficient drinking water for the cranes. Salinities in the salt marsh exceeded 23 ppt for much of the winter. An abundant acorn crop attracted numerous cranes to feed on the uplands.

1989-90 winter – 5 lost out of 146 (3.4%), second highest losses to date.
The winter was notable for the amount of crane use in upland areas for foraging and freshwater ponds for drinking. Marsh salinities were recorded as high as 46 ppt. An abundant acorn crop attracted numerous cranes to feed on the uplands. Blue crabs were scarce.

1990-91 winter –11 lost out of 141 (7.8%).
Losses were estimated at 3 adults, 3 subadults and 5 juveniles. Most losses (8 out of 11) occurred during a bad weather stretch in late December through early January along an 8-mile stretch of the refuge. Three of the losses involved chicks that had at Aransas separated from their parents.

1993-94 winter – 7 lost out of 143 (4.9%).
This was the second winter of field work by Chavez-Ramirez and crabs were at very low levels and the cranes overall lost energy reserves during much of the winter. Food resources were considered marginal. 37% of the adult pairs (17 out of 46) failed to nest in the summer of 1994 after returning to Canada. Summer drought raised salinities measured in the marsh. The winter report written by Tom Stehn indicated the lack of blue crabs seemed to be the most significant factor related to crane winter mortality.

2000-01 winter – 6 lost out of 180 (3.3%).
Four adults, 2 juveniles and possibly one subadult died during the winter.
Food sources were considered poor during the winter. It was a bad blue crab winter for the Whooping Cranes. The cranes spent considerable time off their traditional territories and moved extensively in search of food, foraging in uplands or open bays. The amount of upland use was notable. Cranes were observed in unusual locations including uplands and game feeders, including a San Jose family that came over to Lamar, presumably influenced by feeders. These alternate foods were not as nutritious as blue crab (Nelson 1995).

2005-06 winter – 6 lost out of 220 (2.7%).

2008-09 winter – 23 lost out of 270 (8.5%).

The wolfberry crop was very limited. Blue crabs were present initially, but soon became scarce. The cranes occasionally found blue crabs all winter, but at greatly increased search effort. Low tides drained marshes for part of winter. Considerable open bay use was observed. There was remarkably high use of game feeders, including 21 Whoopers on Lamar using feeders and 2 adjacent to Highway 35 north of Holiday Beach. Salinities were high throughout the winter with the cranes making daily use of fresh water to drink.

Chavez-Ramirez, F., **Wehtje**, W. "Potential Impact of Climate Change Scenarios on Whooping Crane Life History." *Wetlands* 32, 11–20 (2012). https://doi.org/10.1007/s13157-011-0250-z

Comments on SAGES (San Antonio Guadalupe Estuarine System) *Final Report* (5 June 2009)
From: Mr. Tom Stehn, of U.S. Fish and Wildlife Service
https://www.gbra.org/wp-content/uploads/2021/04/sagesComments.pdf

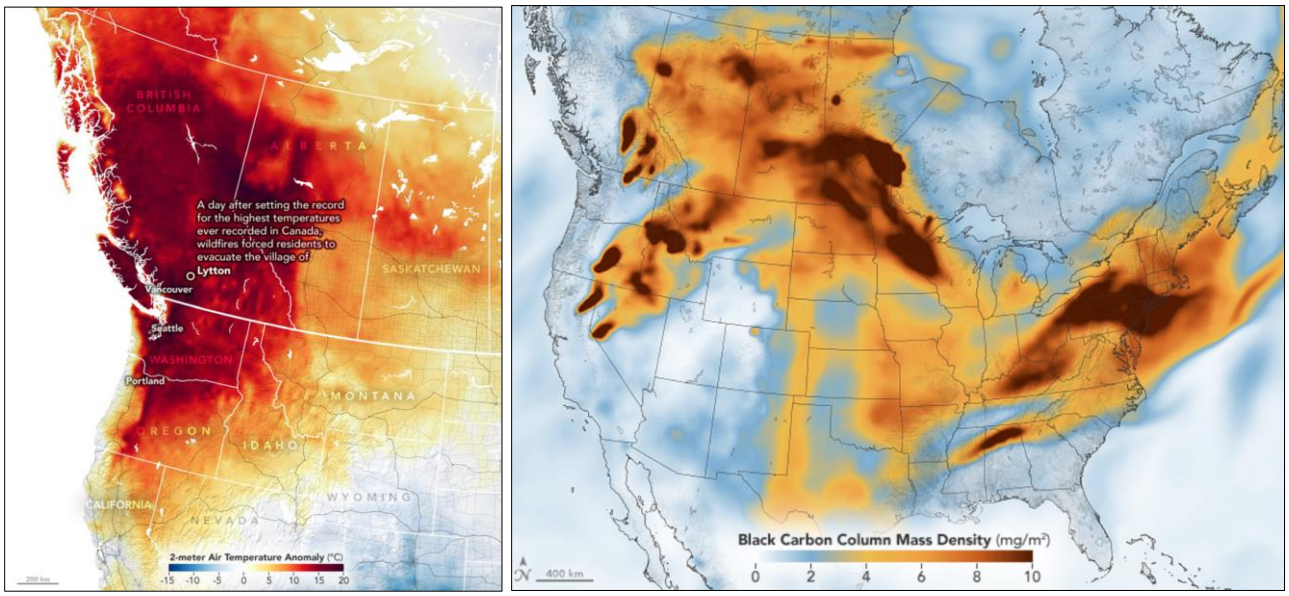
Johns, B. W., **Craig-Moore**, L., "*Smoke and Cranes*" – Summer 2004 in Wood Buffalo National Park WCCA update August 2004

Johns, B. W., **Craig-Moore**, L. "*Wood Buffalo/Aransas Flock*," Fall 2007 WCCA newsletter *Grus Americana*

Kuyt, E., **Barry**, S.J., and **Johns**, B.W., *"Below Average Whooping Crane Production in Wood Buffalo National Park During Drought Years 1990 and 1991" Blue Jay, 50(4), December 1992, pp 225-229*

USFWS "International Recovery Plan / Whooping Crane (*Grus americana*)" Third Revision
March 2007, p.17

Editor: *For those interested in tracking weather, fires, and smoke drift the following provides more information and links to pertinent sites.*



(Left) Record temperatures and wildfires during an unusually severe and odds-defying heat wave that pushed temperatures in British Colombia to record levels*. Those extremes temperatures would have been* "virtually impossible" *without global warming, according to scientists from the* World Weather Attribution initiative*. USCanada_geos_31 July 2021. (Right) The billowing smoke resulted from nearly 300 wildfires currently raging across British Columbia, Canada's westernmost providence and 80 fires blazing through states in the western United States. North America Black Carbon column mass density, 27 July 2021. (Joshua Stevens/NASA Earth Observatory)*

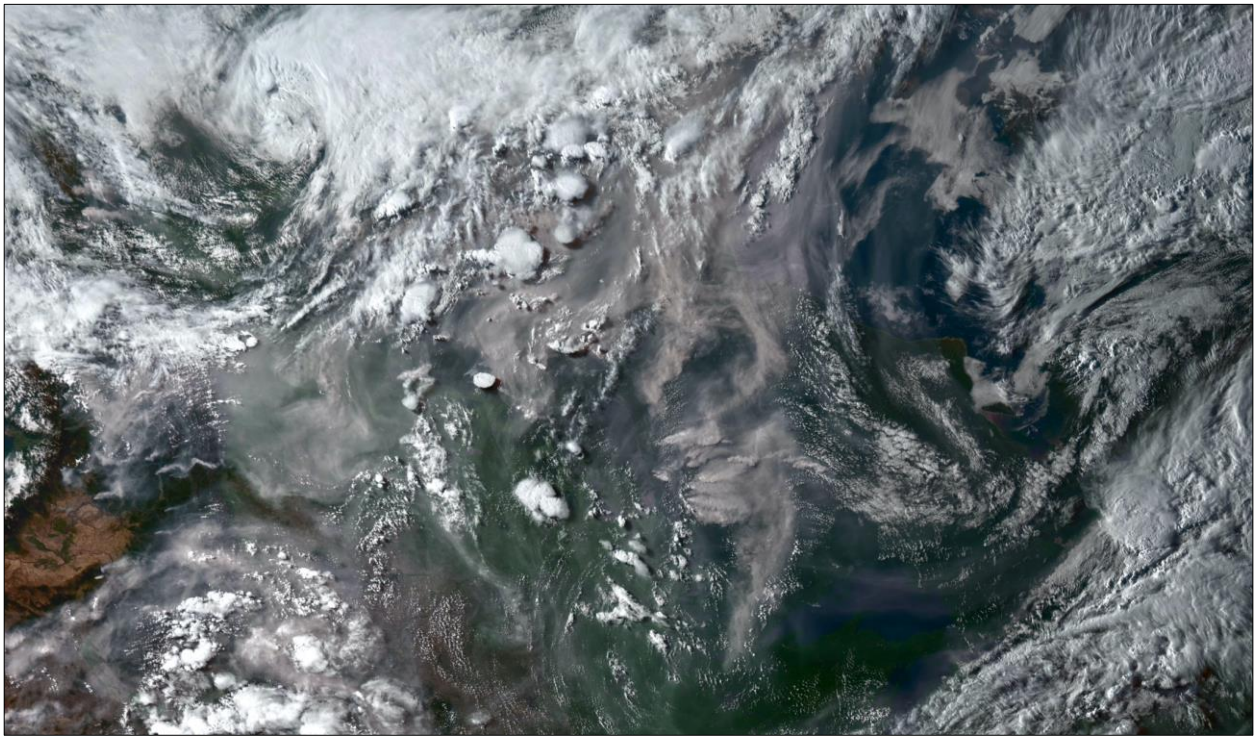
U.S. Drought Monitor
https://droughtmonitor.unl.edu/CurrentMap.aspx

U.S. Drought Monitor/West
https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?West

NOAA / North American Drought Monitor
The North American Drought Monitor (NADM) is a cooperative effort between drought experts in Canada, Mexico, and the United States to monitor drought across the continent on an ongoing basis.
For maps and more information, go here: https://nadm-noaa.hub.arcgis.com

How Canada's wildfires are connected to climate change
As of 26 July 2021, 4,882 large fires were burning in parts of Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, the Northwest Territories and Yukon and parts of Quebec. While wildfires are a normal part of summer, experts say the number and intensity of the fires is worse than ever this year. They are blaming climate change. According to Natural Resources Canada, which is the federal government department that oversees forests, the number of fires this year has gone beyond the historical average, based on the past 25 years of reporting. *For more information go here:* https://www.ciffc.ca
Or here, for maps: https://www.ciffc.ca/fire-information/maps

Smoke plumes from NA western fires stretch across the continent
Particulate matter (PM), or particle pollution, are a mix of liquid droplets and particles of dust, dirt, soot, or smoke that can be seen with the naked eye. Particulates are directly released into the air from smokestacks, fires, construction sites, and unpaved roads. Some of the particles can be so tiny that they can be inhaled. PM less than ten micrometers in diameter can only be seen using a microscope. These tiny particles can reach deep into the lungs, pass into the bloodstream, and cause severe respiratory illness and distress. Particulate matter levels are measured using the Air Quality Index (AQI), with a scale ranging from 0 to 500. Any values above 100 are considered unhealthy. Smoke from western fires caused AQI levels to register in the unhealthy range as far away as Toronto, New York City, and Philadelphia.



In 2000, atmospheric scientists from the U.S. Naval Research Laboratory (NRL) first reported that smoke plumes from intense wildfires could spawn towering thunderstorms that channeled smoke as high or higher than the cruising altitude of jets. These pyrocumulonimbus, or pyroCb (popcorn like formations in image above) – until that time only explosive volcanic eruptions and extreme thunderstorms were thought to be capable of lofting material so high.

Wildfires spawn pyrocumulonimbus
In 2000, atmospheric scientists from the U.S. Naval Research Laboratory (NRL) first reported that smoke plumes from intense wildfires could spawn towering thunderstorms that channeled smoke as high or higher than the cruising altitude of jets. These pyrocumulonimbus, or pyroCb, events wowed scientists at the time. Prior to that discovery, only explosive volcanic eruptions and extreme thunderstorms were thought to be capable of lofting material so high. Though the workings of these smoke-infused storm clouds have come into clearer focus, their increasingly extreme behavior in recent years has surprised and worried some scientists who track them. The latest encounters with these fire-breathing smoke clouds came in North America in June and July 2021 during an unusually warm fire season that arrived early in Canadian and U.S. forests.

Michael Fromm and David Peterson of NRL and a team of colleagues from NASA and several other institutions have used the Advanced Baseline Imager (ABI) on the NOAA-NASA GOES weather satellites, as well as sensors on other satellites, to identify 61 pyroCbs in North America this year as of July 29, 2021, about the halfway point of the fire season. Their observations included a remarkable outbreak of 10 pyroCbs along the Saskatchewan-Manitoba border on July 16. It was more of the wildfire smoke storms than scientists have ever observed in North America on a single day since they started tracking all of them with satellites in 2013.

For more amazing photos and information from the NASA Earth Observatory, go here:
https://earthobservatory.nasa.gov/images/148630/a-summer-of-fire-breathing-smoke-storms

Aransas-Wood Buffalo Whooping Cranes

Whooping Crane family at Aransas National Wildlife Refuge, Texas 6 March 2008. Photo by Klaus Nigge / USFWS

Report your sightings

Friends of the Wild Whoopers is asking the public to report any Whooping Cranes they see along rivers, wetlands, and fields. If you should observe a Whooping Crane as they migrate along the Central Flyway, please report your observations to the proper wildlife agency/agencies in your state. Please include

where and when the bird(s) were observed and whether they were banded and are carrying telemetry. Indicate color band combinations and which leg(s) the bands/telemetry are on. Please do not approach the cranes but use spotting scopes to ascertain the information. If a crane changes its behavior, you are too close!

Following is a list of agencies and contact information compiled by Friends of the Wild Whoopers:

Montana Reports
Allison Begley
MT Fish, Wildlife, & Parks
1420 East Sixth Avenue
Helena, MT 59620
abegley@mt.gov
(406) 444-3370

Jim Hansen
MT Fish, Wildlife, & Parks
2300 Lake Elmo Drive
Billings, MT 59105
jihansen@mt.gov
(406) 247-2957

North Dakota
U.S. Fish and Wildlife Service offices at
Lostwood, (701-848-2466)
Audubon, (701-442-5474)
National wildlife refuges
North Dakota Game and Fish Department in
Bismarck, (701-328-6300)
or to local game wardens

South Dakota
Eileen Dowd Stukel
eileen.dowdstukel@state.sd.us; (605-773-4229)
Casey Heimerl; (605-773-4345)
Natalie Gates; Natalie_Gates@fws.gov;
(605-224-8793), ext. 227
Jay Peterson; Jay_Peterson@fws.gov;
(605-885-6320), ext. 213

Nebraska
Nebraska Game and Parks (402-471-0641)
U.S. Fish and Wildlife Service (308-379-5562)
The Crane Trust's Whooper Watch hotline
(888-399-2824)
Emails may be submitted to
joel.jorgensen@nebraska.gov

Kansas
Jason Wagner
jason.wagner@ks.gov
(620-793-3066)

Ed Miller
ed.miller@ks.gov
(620-331-6820)

***Whooping Crane sightings at or near Quivira NWR should be reported to*:**
Quivira National Wildlife Refuge
620-486-2393
They can also be reported to this
email: quivira@fws.gov

Oklahoma
Sightings can be logged online here
Matt Fullerton
Endangered Species Biologist
(580-571-5820)
Mark Howery
Wildlife Diversity Biologist
(405-990-7259)

Happy 60th Birthday WCCA!

The Whooping Crane Conservation Association (WCCA) was founded in 1961 (incorporated in 1966) by American and Canadian conservationists, all members of the "Whooper Club," dedicated to saving the Whooping Crane from looming extinction. In 1961 there were only three dozen Whooping Cranes in the Aransas-Wood Buffalo population (AWBP). Today there are roughly 500.

WCCA is an all-volunteer, nonprofit 501(c)(3) corporation with the purpose of advancing conservation, protection, and propagation of Whooping Cranes. By joining WCCA your membership directly benefits North America's tallest bird, you receive the WCCA newsletter *Grus Americana*, and WCCA provides you with up-to-date comprehensive news and other items of interest about Whooping Cranes by way of its website www.whoopingcrane.com
For membership detail information and to join, go here: www.whoopingcrane.com

An opportunity to help preserve winter habitat

Become part of those working with the Whooping Crane Conservation Association (WCCA) and other conservation groups in preserving winter habitat for Whooping Cranes! Coastal properties are expensive.

The cost of the 720 acres acquired in Texas in November 2016 (see *Grus Americana* vol. 54. no. 2) was slightly over one million U.S. dollars or $1,389 per acre. WCCA welcomes any amount that you can donate towards purchase of habitat. Donations can be made through the WCCA website http://whoopingcrane.com or by sending a check to the Whooping Crane Conservation Association, 125 Millwood Ln, North Augusta, SC, 29860. Please indicate that your contribution is for the purchase of habitat. WCCA is an all-volunteer, nonprofit 501(c)(3) corporation with the purpose of advancing conservation, protection, and propagation of Whooping Cranes. The Association can receive funds by gifts, bequests, legacies or transfers and administers such funds for the benefit of cranes. Donations from U.S. residents are tax deductible. Thank you for your help for these marvelous birds.

"Flight of the Whooping Crane"

A 1984 *National Geographic* documentary uploaded to YouTube within the past year:
https://www.youtube.com/watch?v=QnA2Uv4SJtI
Features:

- Tracking a family of radio-tagged Whooping Cranes by air and land as the trio migrated from Aransas NWR to Wood Buffalo National Park in April 1983 – *spoiler alert*: it took the birds only 14 days, despite bouts of poor weather!
- Patuxent's Whooping Crane breeding program
- Whooping Crane cross-fostering experiment at Grays Lake NWR, Idaho

Record year for Whooping Crane nests at Wood Buffalo NP

https://www.friendsofthewildwhoopers.org/record-year-for-whooping-crane-nests-at-wood-buffalo-np/
It was a record year for the 2021 Whooping Crane nesting season at Wood Buffalo National Park, (WBNP). Park and wildlife officials counted 102 nests during the spring aerial survey. In 2017, a total of 98 nests were observed on the nesting grounds. This year the nests were found using traditional flights and at least 4 of the nests were found using the crowdsourcing techniques, Zooniverse (*see following*) During the CWS aerial surveys done in August there were at least 50 chicks counted however the number may actually be higher. All juveniles will reach fledging age by mid-September.

Citizen scientists still needed to help find nesting Whooping Cranes in Wood Buffalo National Park

In an ongoing project (*mentioned in the ECB June 2021 issue*), the Canadian Wildlife Service (CWS), Parks Canada, and other cooperators are looking for citizen scientist volunteers to help detect nesting Whooping Cranes in Wood Buffalo National Park, by viewing online satellite images of the breeding grounds — from the comfort of your home! The crowdsourcing project is ongoing, and more virtual volunteers are invited to join the project. To date, 59,000 images have been reviewed – but around 100,000 images taken over a few weeks during the nesting period still need to be looked at.

Nesting Whooping Cranes have been monitored by CWS from small aircraft since the 1960s. Aerial surveys are costly and involve some risk to personnel, so we are interested to know if some surveys, particularly in new breeding areas, can be replaced by collection and analysis of satellite imagery. Because Whooping Cranes are large, white birds that nest in open landscapes, it is possible to detect them in satellite imagery. Scientists have developed an algorithm that uses spectral and spatial characteristics for classification of nesting Whooping Cranes, known as object-based image analysis (OBIA) that will be used alongside classification of nesting Whooping Cranes by citizen scientists to detect new breeding areas.

Research Aims –

1. Detect new Whooping Crane nests in Wood Buffalo National Park and nearby areas by citizen scientists and OBIA.
2. Quantify and compare the cost of using citizen scientists to detect nesting Whooping Cranes, compared to OBIA and aerial surveys.

To learn more about the project and sign up, go to zooniverse.org/projects/whcr-cr/whooping-cranes/

Eastern Migratory Population of Whooping Cranes

Eastern Migratory Population WHCR Update – September 1, 2021

Below is the most recent update for the Eastern Migratory Population of Whooping Cranes. In the last month, three more wild-hatched chicks have fledged! A huge thank-you to the staff of the U.S. Fish and Wildlife Service, the Departments of Natural Resources of flyway states, the International Crane Foundation, and all the volunteers who help us keep track of the cranes throughout the year. We appreciate your contribution to the recovery of the Whooping Crane Eastern Migratory Population. This report is produced by the International Crane Foundation for the Whooping Crane Eastern Partnership. Near real-time locations of Whooping Cranes in this population can be seen at https://whoopermap.savingcranes.org/

Population Estimate
The current estimated population size is 78 (37 F, 37 M, 4 U). This now includes this year's wild-hatched chicks. 19 of these 78 individuals are wild-hatched and the rest are captive-reared. To the best of our knowledge, as of 1 September, there are at least 68 Whooping Cranes in Wisconsin and 2 in Michigan. The remaining birds' locations have not been confirmed in the last month.

2021 Wild-hatched Cohort
Nesting season is complete and there were 14 chicks confirmed to have hatched and up to 4 are still alive.

- W2-21 (U) hatched to parents 3-14 and 4-12 in Green Lake County at the beginning of May, is still alive and fledged in July.
- W10-21 (U) hatched to parents 12-03 and 12-05 at Necedah National Wildlife Refuge in Juneau County, is still alive, and fledged mid-August.
- W11-21 (M) hatched to parents 36-09 and 18-03 at Necedah National Wildlife Refuge in Juneau County, is still alive, and fledged mid-August.
- W14-21 (M) hatched to parents 25-09 and 2-04 at Necedah National Wildlife Refuge in Juneau County, is still alive, and fledged in late August.

2020 Wild-hatched Cohort

- W3-20 (F) was last seen in Taylor Co, WI in late May.
- W13-20 (M) is in Dodge Co, WI, with 74-18 (M) and sometimes 16-11 (M) and 79-19 (F).
- W14-20 (M) is still in Juneau Co, WI, and has been seen with W6-18 (M).
- W18-20 (F) and 80-19 (F) showed up in Fond du Lac Co, WI during August.

2019 Cohort

- W1-19 (F) is in Portage Co, WI with 1-17 (M).
- W14-19 (F) was last seen in Juneau Co, WI, with W14-20 (M) and W6-18 (M) during July.
- W19-19 (U) was last seen in Juneau Co, WI, with W10-18 (U) during July.
- 79-19 (F) is in Dodge County, WI with 16-11 (M) and sometimes 74-18 (M) and W13-20 (M).
- 80-19 (F) and W18-20 (F) showed up in Fond du Lac Co, WI during August.

Mortality, Long-term missing
W3-18 (F) was found dead during July, but the cause of death is unknown.

None known of during August.

To follow the reintroduced eastern population, go here: https://whoopermap.savingcranes.org/
Within map locations is a list of WHCR, click on links to individual cranes for its biographical information.

For biographies of the reintroduced eastern migratory population of Whooping Crane, go here:
https://www.savingcranes.org/whooping-crane-biographies/

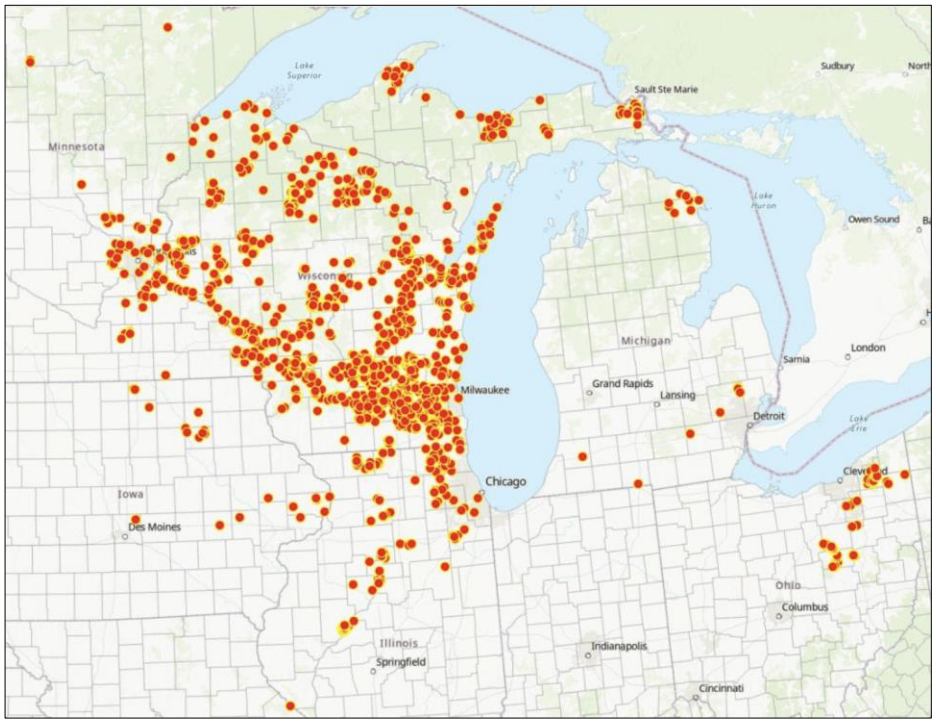
Data courtesy of Whooping Crane Eastern Partnership (WCEP)

***W = Wild hatched** to a wild Whooping Crane pair that then teach the migration route to the juvenile.*
To report a banded Whooping Crane sighting, go here:
https://www.savingcranes.org/report-whooping-crane/

2021 Annual Midwest Sandhill Crane Count

Beginning in 1976 as the Columbia County Crane Survey, the Annual Midwest Crane Count has grown over four decades to include portions of six states in the upper Midwest, including Illinois, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. The International Crane Foundation uses the crane count data to study Sandhill Crane population trends and the new areas where cranes are colonizing. The survey also is a powerful tool for creating awareness about cranes and their wetland habitats.

This spring, nearly 1,700 volunteers traveled to their local wetlands and favorite birding locations to participate in the Annual Midwest Crane Count. This annual survey spanned over 120 counties – see map – in six states in the upper Midwest, including Wisconsin and portions of Illinois, Iowa, Michigan, Ohio, and Minnesota. Thank you to all crane count participants and county coordinators for your continuing support!



Save the date for the 2022 Survey – 9 April 2022!

Learn more about the crane count and how you can get involved at cranecount.org

For the 2021 annual Midwest crane count totals, go here:
https://www.savingcranes.org/wp-content/uploads/2021/08/annual_midwest_crane_count_totals_2021.pdf?utm_source=newsletter&utm_medium=email&utm_campaign=august_contact_call

General News

Alabama:

Tennessee river "Cleanup for the Cranes"

The Decatur Morgan County Tourism and Wheeler National Wildlife Refuge in partnership with Tennessee RiverLine are hosting a river stewardship event to collect litter from the Tennessee River. Set for September 18, 2021, "Clean Up for the Cranes" is a volunteer event designed to help clean the Tennessee River while raising awareness of its recreational impact to the city of Decatur and

Morgan County. Volunteers will remove trash along the Tennessee River and within the Wheeler National Wildlife Refuge with support from team members of Wheeler National Wildlife Refuge, Keep the Tennessee River Beautiful (KTNRB), Decatur Morgan County Tourism and the Tennessee RiverLine.

"The impact of this cleanup goes far beyond the Tennessee River," added Decatur Morgan County Tourism President and CEO Danielle Gibson. "The Wheeler National Wildlife Refuge is home to 14,000 Sandhill Cranes along with a few Whooping Cranes who spend the winter here each year. In celebration of the winter migration of these long-legged and long-necked birds, Wheeler Wildlife Refuge Association hosts "Festival of the Cranes," an annual event held in January that offers a variety of activities for experienced birders and anyone who would like to learn more about birding and other wildlife that call the Refuge home. The cleanup will help preserve wildlife habitat and protect our natural resources for future generations to enjoy." *For more information on the cleanup, call Gibson at 256-350-2028.*

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Louisiana:

Whooping Cranes complete a full flightless molt of primary flight feathers every 2-3 years rendering them more vulnerable to predation threats during the several weeks until the feathers grow in. The above series of photos show the primary feather molt on L10-15. ***Left:*** *Mid-July shows new feathers just emerging from sheaths, in the early stages of regrowing. Two weeks earlier she had just started the molt and was losing feathers.* ***Center:*** *July 27, primaries had grown significantly but L10-15 was still unable to fly.* ***Right:*** *Mid-August, primary flight feathers have grown in, and L10-15 is again fully flighted. All photographs are courtesy of Dan Womack/LDWF.*

Recent posts by Louisiana Department of Wildlife and Fisheries - Whooping Cranes

(23 August 2021) In addition to monitoring growing chicks throughout the spring and summer, we also monitor their parents and all the other adult birds in our population for molt. Whooping cranes lose all their flight feathers when they molt and therefore are flightless for about 6 weeks while the new feathers grow. They typically undergo this molt for the first time when they're 2, 3, or sometimes 4 years old and then molt again every 2-3 years. We documented female L10-15 at the very beginning of her molt at the end of June and then thanks to the great photos from our friend, Dan Womack, we were able to track the progress as her new feathers grew.

(19 August 2021) Our second youngest wild-hatched chick (Allen Parish) has fledged! The family (L3-11, L1-13, and LW14-21) was not found on their nesting territory last week when the chick would have been 74 days old, but we were able to find them during our flight! That makes 4 fledged, wild-hatched chicks so far this year, with one more to go in eastern Texas!

(17 August 2021) All our crane chicks and families are special but LW6 & LW7-21 are a little bit extra special! Their mom, L7-11, was the first female to lay eggs back in 2014 but unfortunately, she and her first mate only produced infertile eggs. Luckily, she and her new mate have been able to produce fertile eggs but hadn't been successful in hatching them until this year. They lost their first nest this year to the deep freeze we had in mid-February but tried again and were successful; persistence pays off!!

(13 August 2021) Earlier this week we confirmed that male L13-16, who tragically lost both his mate and his chick earlier this year, has found a new mate in female LW3-17! LW3-17 was hatched and reared in the wild in Jefferson Davis Parish in 2017. The two had been spotted together in mid-June but this week was the first time we were able to get a confirmation on her ID!

(10 August 2021) Last week we shared some of Dr. Boutte's photos of our TX crane family from when the chick was younger, today we share some more from just a week or two ago showing how much the chick, who will be 6 weeks old on Saturday, has grown! Thanks again to Dr. Boutte for capturing these and sharing them with us and all of you!

"Conservation Conversations – Whooping Cranes"
On the one-year anniversary of the Conservation Conversations podcast, Ed Pratt interviews Sara Zimorski, Biologist for the Louisiana Whooping Crane restoration project/Louisiana Department of Wildlife and Fisheries. *To listen, go here:* https://www.facebook.com/ldwffb/videos/195399512523614/

1 September 2021 while tracking cranes, LDWF biologists were able to get a great look at wild-hatched LW14-21 in Allen Parish! She still has a lot of the cinnamon-colored juvenile feathers at 96 days old. This is the adults (male L1-13 & female L3-11) second chick they successfully raised to fledging.

Help LDWF by reporting all Whooping Crane sightings and violations

If you are lucky enough to see a Whooping Crane, please do not approach it, even in a vehicle, to avoid habituating the birds to human activity. If you share the sighting on social media, bird listservs, or other public sites, please do not share location information more specific than county or parish level.
https://www.wlf.louisiana.gov/page/report-a-whooping-crane-sighting-or-violation

If you see a Whooping Crane elsewhere in the eastern United States (besides Louisiana), please report it here*: https://www.savingcranes.org/report-whooping-crane/*

If you see a Whooping Crane in the western United States, please report it here*:*
https://whoopingcrane.com/report-a-sighting/

Note: Whooping Cranes in the Louisiana population have been known to travel into surrounding states.

Anyone witnessing suspicious activity involving Whooping Cranes is advised to call the LDWF's Enforcement Division at 1-800-442-2511 or use the tip411 program, which may offer a cash reward for information leading to arrests or convictions. To use the tip411 program, citizens can text LADWF and their tip to 847411 or download the "LADWF Tips" iPhone app from the Apple iTunes store free of charge. Citizen Observer, the tip411 provider, uses technology that removes all identifying information before LDWF receives the text so that LDWF cannot identify the sender.

For LDWF updates on the Louisiana non-migratory population of Whooping Cranes, go here:
https://www.facebook.com/lawhoopingcranes/

Utah:

Utah DWR "euthanized" Sandhill for attacking reflection…

Editor: *The below described behavior doesn't seem abnormal on the part of the crane. There are many similar documented cases of aggressive behavior towards a vehicle when a bird sees its own reflection and perceiving it as a "rival" attacks the car. What symptoms of illness were exhibited to lead to the "problem" crane's being shot rather than discouraged from its behavior in a nonlethal manner?*

Recently, officers from the Utah Division of Wildlife Resources (DWR) shot and killed one of a pair of Sandhill Cranes that had been pecking cars at the Rivers Edge, a Heber Valley campground. UDWR planned to kill both cranes, but upon shooting the one crane, its mate flew off.

The bird's death prompted an outcry from witnesses. Faith Jolley, public information officer for the DWR, said the bird was euthanized, and the shooting was *an unfortunate necessity due to evidence that the bird and its mate were ill.* It seems that two veterinarians were consulted by DWR and both confirmed that the birds *could* potentially be exhibiting symptoms common with neurological disease, such as West Nile or some kind of toxin ingestion. The recommendation was made that the bird and its mate be "euthanized" and a necropsy performed to investigate why they're acting "abnormally." The bird's carcass was delivered to a lab for a necropsy to test for disease and toxins.

DWR informed the camp host prior to their arrival that they would be killing the Sandhill Cranes to prevent any further vehicle damage, public property damage, as well as those potential disease concerns.

Wisconsin:

Whooping cranes Tiki and Torch proud foster parents

The Milwaukee County Zoo is excited to announce the arrival and hatching of a Whooping Crane foster egg! The Zoo received the egg from the International Crane Foundation on May 29 with the hope that resident Whooping Crane pair, Torch and Tiki, would incubate the egg. They did, and a healthy female chick hatched June 1. Torch and Tiki are doing an excellent job as "foster parents," and are teaching the chick important life skills, such as how to forage and obtain food.

The Zoo will update visitors as to when they'll be able to see the chick in the Whooping Crane habitat, which is located near the exit of the Herb and Nada Mahler Family Aviary.

To read the press release from the International Crane Foundation, go here:
https://www.savingcranes.org/whooping-cranes-tiki-torch-proud-foster-parents-milwaukee-county-zoo/

Habitat Matters!

Canada:

Severe drought leaves marshland dry

The Luck Lake Heritage Marsh an Important Bird Area (IBA), and Luck Lake located in southcentral Saskatchewan near the village of Birsay, has long been a migratory bird stopover on the Central North American Flyway during fall migration, as well as home to shorebirds and others dependent on the marsh habitat.

Under normal circumstances, Luck Lake would dry up roughly every other summer. In 1987, the Saskatchewan Water Corporation began construction of an irrigation system in the Birsay area. Water was piped out of Lake Diefenbaker in the Saskatchewan River Valley onto Luck Lake's plain. With a ready source of water, Ducks Unlimited Canada, the Saskatchewan Wildlife Federation, Wildlife Habitat Canada, and the Saskatchewan Natural History Society facilitated the pumping of water into Luck Lake and the subsequent management of water levels behind strategically constructed dikes. Through their efforts, Luck Lake was developed as a Heritage Marsh, with water being pumped in from Lake Diefenbaker to augment natural runoff.

Luck Lake is of primary importance for species that congregate at the lake in large numbers during migration. These birds include Tundra Swan, Greater White-fronted Goose, Lesser Snow Goose, Sandhill Crane, Hudsonian Godwit and Franklin's Gull, as well as Marbled Godwits during the summer. In the early 1990s, peak counts for the species were greater than 1% of the population in this region, making Luck Lake globally significant in IBA terms. In addition to these species, thousands of other shorebirds, waterfowl, and occasionally the endangered Whooping Crane make use of Luck Lake during fall migration.

Unfortunately, the major threat to the site is increasingly competition for water during periods of low mountain runoff. Luck Lake is last in line for water after the needs for irrigation have been met. During low water years there may not be sufficient water to fill the basins. A report from the area in late June 2021 indicated that the 800-acre marsh on the south side of the lake has all but vanished.

To view a map of Luck Lake, go here:
https://www.ibacanada.org/mobile/siteMap.jsp?siteID=SK003

https://www.ibacanada.org/documents/conservationplans/sklucklake.pdf

Iowa:

Goose Lake Wildlife Area – "drumlins" remnant of receding glacier

The Goose Lake Wildlife Area is a 2,296-acre property consisting of approximately 570 acres of open grassland, 550 acres of mixed hardwoods upland forest, 430 acres of open marsh and floating sedge meadow, 700 acres of shrub-carr and brushy uplands and 40 acres of tamarack bog. Goose Lake Wildlife Area is a remnant of the original wetland-drumlin complex left by the receding Wisconsin glacier and is home to several drumlins and a relatively undisturbed bog and lake surrounded by floating sedge meadow.

Within Goose Lake Wildlife Area lies Goose Lake Drumlins State Natural Area. A remnant of the wetland-drumlin complex left by the receding Wisconsin glacier, the area is a forested complex with tamarack and mixed deciduous forest on adjacent drumlins. The natural area was designated in recognition of the unique geologic and floral features of the property. Numerous waterfowl use the area including Sandhill Crane, Lesser Scaup, Blue-winged Teal and Wood Duck. Other animals include otter, mink and muskrat.

Rare plants include Swamp Agrimony (*Agrimonia parviflora*), Tufted Bulrush (*Scirpus cespitosus*) and two orchids. Goose Lake Drumlins is owned by the DNR and was designated a state natural area in 2002.

Located in northeast Clinton County, the area has hosted birders, hikers, hunters, and paddlers since the 1940s. The large, natural, high-quality marsh is unique for eastern Iowa. It's even more rare that one wildlife area feeds two watersheds – the portion to the north of Iowa 136 flows to the Maquoketa River; the portion to the south flows to the Wapsipinicon River.

Goose Lake is a permanent nesting site for Sandhill Cranes and Trumpeter Swans, two iconic restoration species according to Curt Kemmerer, wildlife biologist for the Iowa Department of Natural Resources (IDNR). The state endangered King Rail and Northern Harrier can be found at the wildlife area, as well as the Yellow-headed Blackbird, that is becoming less common in Iowa. Habitat there is good for amphibians, reptiles, and other wildlife but the IDNR continues its work to improve the area diversity. After an 80-acre tract underwent a prescribed burn this spring, native prairie plants returned – among them Rattlesnake Master, Spiderwort, Cup Plant, Pale Purple Coneflower, Goldenrod, Oxeyes, Gray-headed Coneflower, and Compass Plant. Reconstructed prairie can offer reliable nesting habitat for upland birds.

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Platte River. Photo by Cody Wagner/Audubon

Nebraska:

Working to aid in the resilience of the Platte River Basin

The University of Nebraska-Lincoln National Science Foundation National Research Traineeship (NRT) program trains master's and doctoral students in understanding resilience of agricultural ecosystems, particularly the Platte River Basin in Nebraska. The NRT students come from multiple disciplines—the natural, computational, engineering, agricultural and social sciences—to study panarchy theory, novel sensing technologies and modeling, adaptive management, and policy interventions. They strive to develop tools that can collect, synthesize, and analyze data to inform decisions and policies for managing water resources. They hope to keep the Platte River Basin and other agro-ecosystems healthy and resilient for all who depend upon them now and for generations to come.

Andrew Caven, the director of conservation research at the Crane Trust in Nebraska, spoke to NRT students May 18 about the organization's latest research and the work being done to protect and restore Platte River habitat for Sandhill Cranes, endangered Whooping Cranes and other birds, plants and animals, as well as the management challenges that goes along with it all.

Historically, the Platte River and North Platte River from west of Lake McConaughy to Grand Island served as stopover habitat for Sandhill Cranes, but after dam constructions in the early to mid-1900s, some channels in the Platte narrowed and others dried up completely, he said.

The Crane Trust is in the middle of the current 50-percent migration corridor for Whooping Cranes, monitoring about 10,000 acres in the Big Bend region in south-central Nebraska. Trust researchers monitor not only Sandhill Crane distribution and Whooping Crane habitat use but also the region's vegetation, breeding birds, small mammals, rare butterflies like the Regal Fritillary, fish like the Plains Topminnow, and channel morphology.

They share their data and findings with universities and other organizations and governmental bodies through their nature center and trails, publications and reports, presentations and trainings, youth education and advocacy work. The Crane Trust manages the land adaptively, incorporating research findings and simulating natural disturbances, like wildfire and flooding, deemed helpful to wetland species.

To read more about the Platte River protection and restoration work done by the Crane Trust, go here: https://nrt.unl.edu/crane-trust-discusses-cranes-and-research-nrt

Platte-Republican Diversion

Editor: *The following are excerpts from Audubon Nebraska's objection, and some background information for it, in response to a proposal to transfer water from the Platte River Basin to the Republican River Basin.*

On 28 December 2020, Audubon Nebraska submitted a legal objection to a proposed transfer of streamflow from the Platte River Basin to the Republican River Basin. If approved, this "interbasin transfer" would divert water from one overused river to another, resulting in few long-term benefits to either basin – but many ecological costs for both.

Both the Platte and Republican River basins are short on water supply but high in water demand. Nebraska has the highest reported number of irrigated acres in the nation and communities within both river basins rely heavily on the local agricultural economy.

Nebraska, Colorado, Wyoming, and the federal government have invested millions of dollars and decades of work into increasing streamflow in the central Platte River, which is critical habitat for the endangered and threatened species such as the Whooping Crane and Piping Plover, as well as other important species including the Interior Least Tern and the Sandhill Crane.

Proponents of the proposed interbasin transfer claim that only water that is not held under an approved water right will be diverted from the Platte River, but it must be remembered that there are benefits to having water in a river beyond fulfilling state-approved water rights and this stretch of the river is already either over-appropriated or fully appropriated. Platte River stream flows also support quality of life for surrounding communities through the provision of clean drinking water, recreation, wildlife viewing, and hunting opportunities, and recharge for groundwater aquifers where water can be "banked" – saved during times of plenty and withdrawn during times of drought.

ENVIRONMENTAL impact issues:

Canada:

Canada's environmental laws fall short

New research shows biodiversity management in Canada is undertaken through a bewildering array of laws, regulations and tools that do little to protect species and ecosystems

When Canada developed its first national Biodiversity Strategy in 1995, it did so under the assumption that a strong foundation of laws and policies was already in place. Twenty-five years later, however, prevailing biodiversity trends indicate otherwise. New research demonstrates how the management of biodiversity in Canada is undertaken through a bewildering array of laws, regulations and other tools

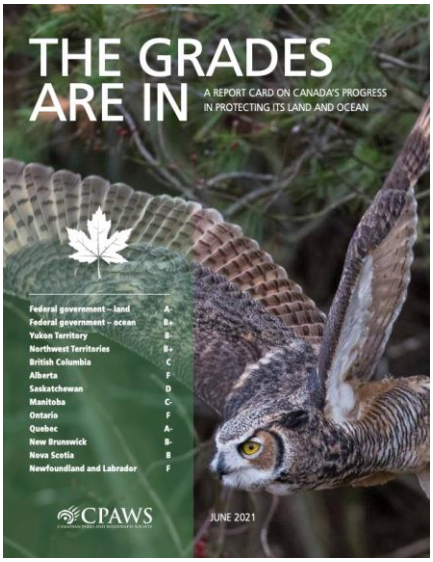
administered by different federal, provincial and territorial departments. Collectively, these provide fragmented and inadequate protection to species and ecosystems.

On July 19 the United Nations World Heritage Committee reported that Wood Buffalo National Park, the largest in Canada, "likely meets the criteria for inscription on the List of World Heritage in Danger." This is largely due to the cumulative effects of industrial developments outside the park stemming from uncoordinated and piecemeal decisions by Alberta and British Columbia governments.

To read more of the 19 July 2021 Opinion piece in the Narwhal, "When it comes to addressing the biodiversity crisis, Canada's environmental laws fall short," by Justina Ray, Andrea Olive and Jaime Grimm, go here: https://thenarwhal.ca/opinion-biodiversity-crisis-environmental-laws/

For the paper by Justina Ray, Andrea Olive and Jaime Grimm
"The biodiversity crisis in Canada: failures and challenges of federal and sub-national strategic and legal frameworks," go here: https://www.facetsjournal.com/doi/10.1139/facets-2020-0075

Report card: Ontario, Alberta, get "F" for conservation effort



In the first analysis of its kind, a national report shows how all provinces and territories are doing in the race to protect more of the country's remaining wild spaces. The following are excerpts from an investigative article by Mike De Souza for The Narwhal.

The federal government, Quebec and the Northwest Territories are leading Canada's efforts to protect land and water, but Ontario, Alberta, Newfoundland and Labrador and Saskatchewan are behind heading in the wrong direction, says a new report card released on Tuesday by the Canadian Parks and Wilderness Society (CPAWS).

The report — The Grades are in: A report card on Canada's progress in protecting its land and ocean — is the first of its kind. It tracked the conservation record of all provinces, territories and the federal government and measured how close each one has come to targets set in 2010 to protect 17 per cent of Canada's terrestrial territory and 10 per cent of its oceans.

The report card had a particularly harsh evaluation of Ontario and Alberta for reversing actions of previous governments that were designed to promote conservation and protect threatened species. Instead of sustaining those policies, the report card said the governments in those provinces had instead chosen to open sensitive areas to new and unsustainable development.

The report card said Alberta had protected 15.4 per cent of its territory by 2020 but began to reverse course in 2019. It is currently permitting industrial activities in many provincial protected areas. This would include a 2020 decision to open up the Eastern Slopes of the Rocky Mountains to coal exploration and mining. Although the government announced new public consultations in response to public pressure, some permits were already issued, the damage had begun and several projects are moving forward, the report card said.

The report also said that about 95 per cent of Alberta's provincial parks do not have management plans, while most of the other parks have plans that are out of date and not implemented.
"Alberta is in urgent need of a conservation course correction," said the report. "This includes not only refraining from policies and actions that threaten natural ecosystems, but also committing to evidence-based conservation targets and standards for protected areas, providing stronger protection for the Eastern Slopes and supporting Indigenous-led conservation initiatives, including Guardians programs."

The Canadian Parks and Wilderness Society also said that this initial report card should serve as a baseline, to track progress in the coming years and that it hopes governments will use it to track which policies are most effective at driving progress.

To download the CPAWS 2021 Report Card, go here:
https://cpawsbc.org/wp-content/uploads/2021/06/CPAWS-2021-Report-Card.pdf

For more about the report, read the 22 June 2021 article "Ontario, Alberta get failing grades for conservation efforts," *by Mike De Souza, Managing Editor of* The Narwhal.

IPCC report: 'Code red' for human driven global heating

Released on August 9, 2021, the UN Secretary-General António Guterres called the Intergovernmental Panel on Climate Change (IPCC)'s landmark report as nothing less than "a code red for humanity. "The alarm bells are deafening, and the evidence is irrefutable".

In an interview with The Narwhal, Canadian research scientist John Fyfe, one of 234 experts from 66 countries who contributed to the 3,949-page IPCC report said the findings showed that the role humans have played in rising global temperatures was "unequivocal." That the warming threshold we're likely on pace to reach between 2030 and 2050 is 1.5 degrees – potentially a decade ahead of previous forecasts. Human influence has warmed the climate at a rate that is unprecedented in at least the last 2,000 years.

And while the current and expected changes to our planet, as a result of greenhouse gas emissions is irreversible, there is still time to limit climate change, IPCC experts say. Strong and sustained reductions in emissions of carbon dioxide (CO2) and other greenhouse gases, could quickly make air quality better, and in 20 to 30 years global temperatures could stabilize.

What it means for Canada: "heat waves, drought, heavy rainfall, all of those things are expected to become more severe and frequent. We expect mountain glaciers to recede even more. We expect our sea ices to decline even more."

To read the article "IPCC report: 'Code red' for human driven global heating warns UN chief," in the UN News Global perspective Human stories / United Nations, go here:
https://news.un.org/en/story/2021/08/1097362

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Indiana:

Climate change threatens a conservation success story

A key stopover for Sandhill Cranes on their journey south is the Jasper-Pulaski Fish and Wildlife Area, near Knox, Indiana, about an hour and a half southeast of Chicago, where they can rest and forage. Nearly the entire eastern population of the Sandhill Crane depends on the marsh wetlands of Jasper-Pulaski, an area designated as a Globally Important Bird Area by National Audubon Society.

With the growing understanding of the value of wetlands– both in terms of supporting wildlife and environmental benefits that include stormwater absorption – efforts were introduced to protect and restore this vital habitat. With the growth of wetlands, the Sandhill Crane population gradually rebounded, a success story that's considered one of the conservation movement's big wins, according to Nathaniel Miller, director of conservation for Audubon Great Lakes.

But that victory is now jeopardy, threatened by the looming climate crisis. The crane's presence at Jasper-Pulaski used to peak in mid-November, now it's becoming late November, and it's conceivable they could start sticking around into January. Some are even short-stopping in migration to overwinter at Jasper-Pulaski.

"Birds are being pushed and tested by climate change," Miller said. "The climatic range of these birds developed over millennia. It's all about timing." In spring, cranes are where insects are hatching. In fall, they're where they can find nuts and berries. General warming trends, as well as extreme events like flooding, drought, and intense heat, throw this delicate balance and timing off kilter impacting breeding success and possibly long-term survival of the species.

Some birds will respond by shifting their range to the north, but in doing so risk displacing or facing competition with species that are already in that habitat. Habitat is slower to evolve than climate.

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Sunrise at Aransas on Texas' central coast. Kaila Drayton/National Wildlife Federation

Texas:

Vulnerability and adaptation to climate change

Editor: *The following are excerpts and cited links from the article by Bob Henson, "Climate change the Texas Mid-Coast: The closest examination yet" / Texas Climate News, 9 June 2021.*

> The quiet, resilient Mid-Coast region of Texas between Corpus Christi and Houston, which has endured vicious hurricanes and faced daunting environmental threats, is now up against its most serious foe yet: human-caused climate change. A report issued in May by the National Wildlife Federation (NWF) examines how sea-level rise, warming temperatures, storm surges, and drops in freshwater inflow are poised to assault the uniquely balanced ecosystems of the area.
>
> According to the NWF, "Vulnerability and Adaptation to Climate Change: An Assessment for the Texas Mid-Coast" is the most detailed analysis to date of how climate-change science from the National Oceanic and Atmospheric Administration and other sources translates to specific impacts on the central Texas coast.
>
> The Mid-Coast's extensive wetlands, both freshwater and saltwater, are home to diverse wildlife – some officially endangered, including Kemp's ridley sea turtles and Whooping Cranes. The report notes that more than half of the region's freshwater wetlands could be lost by 2100, and more than 20% of the Mid-Coast's land could become open water by 2100, jeopardizing many species, structures, and livelihoods.
>
> Like other parts of the northwest Gulf Coast, the Texas Mid-Coast is already being slammed by some of the world's highest rates of sea-level rise. It's the result of rising water levels from

climate change as well as a sinking landscape, the latter mainly from extraction of oil, gas, and groundwater.

In a "report card" on 2020 sea level rise at 32 U.S. sites from Maine to Alaska, the Virginia Institute of Marine Sciences found that Rockport had the second-highest sea level rise (behind only Grand Isle, Louisiana) as well as the greatest acceleration. Water levels rose 7.1 millimeters (0.28 inches) at Rockport in 2020 alone. Other parts of the Mid-Coast aren't running far behind.

Drawing on benchmark regional sea-level projections released by NOAA in 2017, the NWF report finds that even an intermediate-low scenario would see 1.71 feet of sea-level rise at Rockport by 2050 compared to 2000, and 2.82 feet by 2100. Across the four NOAA scenarios (intermediate-low to high), the century-scale rise at Rockport ranges from around 3 to 9 feet. The difference hinges largely on how quickly greenhouse-gas emissions are cut globally.

"Vulnerability and Adaptation to Climate Change: An Assessment for the Texas Mid-Coast"
Citation: **Pathak**, A., & **Fuller**, A. (2021). *Vulnerability and Adaptation to Climate Change: An Assessment for the Texas Mid-Coast*. Austin, TX: National Wildlife Federation.

U.S. sea-level report cards: 2020 again trends toward acceleration
https://www.vims.edu/newsandevents/topstories/2021/slrc_2020.php

Global and regional sea level rise scenarios for the United States
NOAA Technical Report NOS CO-OPS 083 (2017)
https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf

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Developer cancels Keystone XL Pipeline Project

It was announced on June 9, 2021 that TC Energy, the developer of the controversial Keystone XL pipeline, had canceled the project. President Joe Biden revoked the project's permit in January, putting an end to construction efforts on the oil line. The proposed Keystone XL pipeline would have run from tar sands in Canada through Montana, South Dakota and Nebraska and would have resulted in millions of tons of new carbon emissions. The plan had it set to perilously cross two major rivers, including the Missouri and the Ogallala Aquifer. If completed, the pipeline would have disrupted sensitive ecosystems. Tar sands are one of the dirtiest polluting sources of oil on the planet. TC Energy's history of safety with its pipelines is not stellar. Keystone came online in 2010, billed as state-of-the-art technology and one of the safest pipelines ever built. It spilled 35 times in its first year alone – 14 times in the US and 21 times in Canada according to Doug Hayes, a senior attorney at the Sierra Club. In 2019 there were four significant spills caused by problems created during construction. A spill in North Dakota in 2019 spread 400,000-gallons of heavy crude oil mined from the Alberta tar sands onto a wetland.

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Bird survival at odds with national push for more transmission lines

Each fall, hundreds of thousands of migrating waterfowl—including around half of North America's Canvasback population—pass through the Upper Mississippi River National Wildlife and Fish Refuge. Strung along 261 miles of river corridor in Illinois, Iowa, Minnesota, and Wisconsin, the refuge also supports loads of shorebirds, several Great Blue Heron and Great Egret rookeries, and more than 250 active Bald Eagle nests.

That profusion of avian life is one reason environmental groups are trying to block a high-voltage electric transmission line that will cross the refuge on its way from Dubuque County, Iowa, to near Madison, Wisconsin. Electrical wires are a significant threat to birds; by one widely cited estimate (**see below*) shows that between 8 million and 57 million birds die each year in the United States from powerline collisions.

> *…We conducted a quantitative review that incorporated data from 14 studies meeting our inclusion criteria to estimate that between 12 and 64 million birds are killed each year at U.S. power lines, with between 8 and 57 million birds killed by collision and between 0.9 and 11.6 million birds killed by electrocution.…* – "Refining Estimates of Bird Collision and Electrocution Mortality at Power Lines in the United States"

"If you want to build a power line or build a pipeline, you've got property acquisition issues. But if you can march it through public land, you only need to get one approval," says Scott Strand, a senior attorney at the Environmental Law and Policy Center (ELPC), a nonprofit law firm representing the transmission line's opponents. "All of a sudden public land becomes the most attractive place to build these things, which is the exact opposite of what we set aside public lands for."

Opponents of the Cardinal-Hickory Creek transmission project fear the death toll could be especially high for migrants passing through the refuge and worry about the grassland birds in patches of prairie along the line.

If allowed to move forward, the project timeline calls for construction in the Upper Mississippi refuge beginning late 2022. The refuge contains one of the largest areas of floodplain forest in the lower 48 states and is designated as a Wetland of International Importance through the intergovernmental Ramsar Convention. It's also a designated Globally Important Bird Area. Critically endangered Whooping Cranes have been spotted in the refuge where the line will be built, the groups say in their legal complaint, noting that one study blamed power line collisions for 17 percent of Whooping Crane deaths in Wisconsin's small migratory population.

The groups also say the project will require cutting down trees in a roughly 150-foot-wide right of way through southwest Wisconsin's Driftless Area, marring a bucolic landscape of rolling hills and family farms by constructing towers up to 20 stories high. It will also pass through protected patches of remnant and restored prairie, such as the Military Ridge Prairie Heritage Area, which supports 14 rare and declining grassland bird species.

It is one of many proposed projects across the country that have fueled controversy as they will impact marshlands, migratory routes, or grasslands. Modernizing the power grid to realize President Joe Biden's goal of 100 percent carbon-free electricity by 2035 will require an explosion of new transmission lines, experts say. It is a complicated process – one that holds ultimately no good outcome for birds and wildlife, and the loss of extensive habitat – one where the cost outweighs short-lived benefits.

**To read the full text, or to download a pdf of the article "Refining Estimates of Bird Collision and Electrocution Mortality at Power Lines in the United States," go here:*
https://doi.org/10.1371/journal.pone.0101565

Citation: **Loss** SR, **Will** T, **Marra** PP (2014) Refining Estimates of Bird Collision and Electrocution Mortality at Power Lines in the United States. PLoS ONE 9(7): e101565.
https://doi.org/10.1371/journal.pone.0101565

To read the 29 July 2021 article, "Bird Safety a Concern in National Push to Build More Power Lines" by Andy McGlashen, Associate Editor, Audubon Magazine *go here:*
https://www.audubon.org/news/bird-safety-concern-national-push-build-more-power-lines

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Science News:

Potential Impact of Climate Change Scenarios on Whooping Crane Life History

Chavez-Ramirez, F., **Wehtje**, W. "Potential Impact of Climate Change Scenarios on Whooping Crane Life History." *Wetlands* 32, 11–20 (2011). https://doi.org/10.1007/s13157-011-0250-z

Abstract
Whooping crane (*Grus americana*), a rare and critically endangered species, are wetland dependent throughout their life cycle. The whooping crane's small population size, limited distribution, and wetland habitat requirements make them vulnerable to potential climate changes. Climate change predictions suggest overall temperature increases and significant changes in precipitation regimes throughout North America. At the individual level, temperature changes should have neutral to positive effects on thermoregulation and overall energy expenditure throughout the whooping crane's range. In the breeding grounds, earlier snow melt and increasing temperatures should improve food resources. However, increased precipitation and more extreme rainfall events could impact chick survival if rainfall occurs during hatching. Increased precipitation may also alter fire regimes leading to increased woody plant abundance thus reducing nesting habitat quality. During winter, higher temperatures will lead to a northward shifting of the freeze line, which will decrease habitat quality via invasion of black mangrove. Large portions of current winter habitat may be lost if predicted sea level changes occur. Stopover wetland availability during migration may decrease due to drier conditions in the Great Plains. Current and future conservation actions should be planned in light of not only current needs but also considering future expectations.

Are whooping cranes destined for extinction? Climate change imperils recruitment and population growth

Matthew J. **Butler** | Kristine L. **Metzge**r | Grant M. **Harris**
Received: 21 September 2016 | Revised: 26 January 2017 | Accepted: 30 January 2017
DOI: 10.1002/ece3.2892
https://onlinelibrary.wiley.com/doi/epdf/10.1002/ece3.2892

Summary
Identifying climatic drivers of an animal population's vital rates and locating where they operate steers conservation efforts to optimize species recovery. The population growth of endangered whooping cranes (*Grus americana*) hinges on juvenile recruitment. Therefore, we identify climatic drivers (solar activity [sunspots] and weather) of whooping crane recruitment throughout the species' life cycle (breeding, migration, wintering). Our method uses a repeated cross-validated absolute shrinkage and selection operator approach to identify drivers of recruitment. We model effects of climate change on those drivers to predict whooping crane population growth given alternative scenarios of climate change and solar activity. Years with fewer sunspots indicated greater recruitment. Increased precipitation during autumn migration signified less recruitment. On the breeding grounds, fewer days below freezing during winter and more precipitation during breeding suggested less recruitment. We predicted whooping crane recruitment and population growth may fall below long-term averages during all solar cycles when atmospheric CO2 concentration increases, as expected, to 500 ppm by 2050. Species recovery during a typical solar cycle with 500 ppm may require eight times longer than conditions without climate change and the chance of population decline increases to 31%. Although this whooping crane population is growing and may appear secure, long-term threats imposed by climate change and increased solar activity may jeopardize its persistence. Weather on the breeding grounds likely affects recruitment through hydrological processes and predation risk, whereas precipitation during autumn migration may influence juvenile mortality. Mitigating threats or abating climate change should occur within ≈30 years or this wild population of whooping cranes may begin declining.

To read the article and/or to download a full-text PDF, go here:
https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.2892

Environmental Correlates of Reproductive Success for Introduced Resident Whooping Cranes in Florida

Marilyn G. **Spalding**, Martin J. **Folk**, Stephen A. **Nesbitt**, Monica L. **Folk**, and Richard **Kiltie** "Environmental Correlates of Reproductive Success for Introduced Resident Whooping Cranes in Florida," *Waterbirds* 32(4), 538-547, (1 December 2009). https://doi.org/10.1675/063.032.0407

Abstract
Reproduction within a recently re-introduced resident flock of Whooping Cranes (*Grus americana*) in Florida during 1992–2007 was poor compared to an established wild flock. Pairing and nesting increased

with average age of the flock, but fertility, hatching and fledging were variable among years, suggestive of an environmental influence. For climatic variables measured during the incubation period, only maximum soil temperature was associated with the failure of late nests in dry years. However, pre-nesting winter precipitation and water elevation were positively correlated with an index of nesting effort. Winter precipitation was associated with fertility and hatchability, whereas winter marsh water levels were associated with earlier nesting dates and increased egg volume. Both winter precipitation (>8 cm mean monthly) and water elevation (>20.3 m above mean sea level or 68% of full marsh surface area or perimeter) greater than a threshold level appeared to be good predictors for successful reproduction in central Florida, but occurred together in only four of ten study period years. Pairs delayed nesting, had smaller eggs, and hatched and fledged fewer chicks in years with low winter water elevation. Low winter precipitation associated with decreased fertility of eggs may explain the failure of fully incubated nests to hatch in some years. Insufficient stimulation of the neuroendocrine system due to limited rainfall and poor physiological condition due to poor food resources in low water marshes are proposed mechanisms for low fertility and delayed nesting and egg size, respectively. Drought appears to encourage birds to use lake edges for nesting which have increased hazards. Thus, conservation of wetlands for cranes should include deep marshes and lake edges with controlled boat usage during the nesting season. Further investigation is recommended for pre-nesting and incubation behaviors, diseases of eggs, and egg volumes.

The following two paper abstracts are from the North American Crane Working Group 2020 meeting, 8-11 January 2020 Lubbock, Texas https://www.nacwg.org/workshop15_program.pdf

Effects of Saline Lakes and Playa Wetland Ecological State Changes on Sandhill Crane Space Use of the Southern High Plains

David A. **Haukos**
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Abstract
Saline lakes and playa wetlands on the Southern High Plains represent unique ecological systems in a semi-arid landscape. The <50 saline lakes, historically winter roost sites for sandhill cranes, are discharge wetlands directly connected to the Ogallala Aquifer. Exploitation of the Ogallala Aquifer since the 1950s has resulted in the reduction and frequent cessation of spring discharge into saline lakes. Only 4 saline lakes have maintained inundated conditions since 1973. Saline lakes experienced complete drying starting in the 1970s. The ecological state of saline lakes has changed from continuous inundation to one dependent upon unpredictable, intensive precipitation events for inundation. The combination of hydrological changes and landscape changes has resulted in nearly cessation of use of saline lakes by sandhill cranes (*Grus canadensis*). The approximate 20,000 playa wetlands are freshwater wetlands solely dependent on precipitation runoff collectively form principal recharge sites for the Ogallala Aquifer. Historically, playas supported sandhill cranes as a source of freshwater. Anthropogenic alternation to accommodate row-flood irrigation during the 1950s-1990s, changing cropping practices, establishment of exotic grasses in surrounding Conservation Reserve Program (CRP) land, roads, and many other impacts have greatly altered the presence and function of playas. Approximately 20% of playas have been lost from the landscape, <1% are free of any anthropogenic impacts, and function of nearly 60% are nonfunctional. Wintering sandhill cranes have abandoned roosting on saline lakes since the early 2000s and currently depend on the freshwater playas to serve as roost sites. Continued physical and function loss of playas will further constrain space use by sandhill cranes.

Environmental Factors Driving Nocturnal Whooping Crane Movement Patterns on the Texas Wintering Grounds

John P. **Pistone**[1], Wade C. **Harrell**[2], Elizabeth H. **Smith**[1]
[1]International Crane Foundation, Rockport, TX, USA. [2]U.S. Fish and Wildlife Service, Austwell, TX, USA

Abstract
The whooping crane (*Grus americana*) is one of most endangered bird species in North America; an estimated 504 individuals occur in the natural, wild flock. This species migrates from breeding grounds at Wood Buffalo National Park in Canada to wintering grounds in and around Aransas National Wildlife Refuge (ANWR) along the mid-Texas coastline. As the population continues to increase, its range is expanding away from ANWR and into unprotected areas. Studies have assessed diurnal whooping crane

use, but little is known about roost site locations and fidelity. We used 30,000 telemetry data points from 2009 to 2013 provided by the Whooping Crane Tracking Partnership in ArcGIS and R programming to evaluate family roost site selection and movement as they relate to environmental factors (water surface level, wind speed and direction, Palmer Hydrological Drought Index). We created a 95% and 50% kernel density estimate (KDE) home range using the reproducible home range package in R for marked juveniles representing each family. Whooping crane decisions to roost in coastal marsh or open bay habitats are strongly influenced by surface water levels. When long-distance night movements are identified, wind speed was a significant factor. Cranes traveled farther distances, increased the number of core use areas, and had less nocturnal/diurnal site overlap during drought years. These outcomes will be useful to prioritize future conservation locations as the population recovers and becomes more likely to interact with humans across the landscape.

The Art of Cranes:

Native Grand Island "paleosculptor" creates Sandhill sculpture

A depiction of the iconic species that migrate through Nebraska each year attracting craniacs from all over the world to witness the wonder, will soon grace the entrance to the Grand Island Public Library. The Ken and Rosie Staab family have donated funds to install an approximately 15-foot crane sculpture in the grass area in the plaza near the front entrance of the Grand Island Public Library. The sculpture designed by the Staabs' son, features a group of cranes flying and circling the air. The sculpture by the Grand Island native, Gary Staab, is a Kearney-based "paleosculptor" known for his full-scale models of dinosaurs, mummies, and mammoths produced for museums worldwide, as well as for work done for the Smithsonian and Disney.

"It's very exciting since this is the library I went to as a child," Staab said. "Cranes are such a big part of the history of Nebraska and it's a privilege to work on this project."

The kid who always liked to look under rocks and logs for insects ("I still do," Staab says), was raised in Grand Island, Nebraska, and always liked drawing and working with his hands. While attending Hastings College, one day on a field trip to a museum he had an epiphany of sorts. "I thought the animals and bird models I was looking at had to be made by someone, right? So why not me?" he asked.

He graduated from Hastings, which put together a custom art and biology degree program for him. Soon, the museum selected him to build his own exhibit for the Hastings Museum.

Internships followed at the Smithsonian and at what was then known as the British Museum of Natural History. He later spent six years as a sculptor and model maker for the Denver Museum of Nature and Science. Since the late 1990s, Staab has been in business for himself, accepting commissions on a freelance basis as Staab Studios.

To learn more about the fascinating paleosculpture and the artist behind it, go here:
http://kcstudio.org/gary-staab-second-coolest-job-world/
or here:
https://www.paleonerds.com/podcast/garystaab
or here: https://www.staabstudios.com

The impact of the First People license plate on Native youth in Nebraska

Nebraska's First People license plate was designed by Donel Keeler, who died from cancer in spring 2020, a member of the Crow Creek Dakota and Northern Ponca tribes. Money from sales of the plate go to the Chief Standing Bear Scholarship fund, a scholarship awarded Nebraska's Native high school students. This spring the first four scholarships were granted.

(Left) Omaha artist Donel Keeler poses with a piece of his artwork in 2019. It is inscribed: "From the sand hills and the whooping cranes, Standing Bear, Big Elk, Charging Bison, Eagles and the Indigenous Nations we are Nebraska." (Right) Keeler created Nebraska's First People license plate.

The Native high school applicants for the Chief Standing Bear scholarship submitted essays about their lives, their dreams for the future and what they planned to study and where. Five students were chosen to receive $5,000 scholarships; four of them funded from sales of the plates.

Officials expect to continue to receive at least $20,000 a year flowing into the Chief Standing Bear Scholarship Fund from plate revenue and new plate purchases, said Judi gaiashkibos, executive director of the Nebraska Commission on Indian Affairs. "The sales of the plate surpassed our wildest dreams," gaiashkibos said. "We are thankful for all of the Nebraskans, current and future, that support this license plate that establishes scholarships for Native American students."

Kayaker wins Audubon Photography Award for photo of Sandhill Cranes

Robin Ulery of Johns Lake, Winter Garden, Florida beat out thousands of applicants to win the 2021 Audubon Photography Awards top prize in the amateur photographers category. The photo a Sandhill Crane and its colt was taken while Ulery was kayaking near her home.

Sandhill Crane and colt. John Lake, Florida. Photograph by Robin Ulery, 2021 Audubon Photography Awards, amateur photographer category winner.

To view additional winning photographs, go here:
https://www.audubon.org/magazine/summer-2021/the-2021-audubon-photography-awards-winners-and

Whooper goes to the Indiana State Fair

Sean Kenney is a renowned, award-winning artist who uses LEGO® pieces to design and create contemporary sculpture, travelling exhibits, children's books, and commercial products. The Whooping Crane on display at the Indiana State Fair is part of a collection that offers larger-than-life, nature-inspired sculptures and creations made entirely from LEGO® pieces that provide an opportunity for viewers to learn about animal endangerment, the balance of the ecosystems and mankind's relationship with nature. This is especially appropriate as a large percentage of the reintroduced Eastern Migratory Population of Whooping Cranes winter each year in Greene County Indiana, and an annual crane festival takes place in Linton.

The white dots (318) on the ground base represent the world population of Whooping Cranes at the time the sculpture was made (*see left photo below). For more photos of the LEGO Whooping Crane in the artist's studio, go here:* https://seankenney.com/portfolio.php/whooping-crane/

Upcoming Events:

Editor: *While almost half of the nation's adult population is now fully vaccinated against the COVID-19 pandemic, there are still cancellations or postponement of many scheduled events due to uncertainties from the highly contagious Delta variant of the virus. Some festivals have chosen to modify formats and have a "virtual" platform in response to the odd times we are in. On a positive note, and while not the same as taking part in person, more people will be able to participate in the virtual festival(s) from afar – so check them out and have fun! Remember to check with coordinators as festival information changes.*

21st Annual Sandhill Crane Festival
Tanana Valley Alaska
Dates: Saturday, August 21 – Sunday, August 22, 2021
Location: Creamer's Field Migratory Waterfowl Refuge, Tanana Valley,
1300 College Road, Fairbanks, Alaska 99701
Celebrate fall migration and Sandhill Cranes at Creamer's Field! There are events throughout the weekend, including two guided walks to our bird banding station.
Most events are free of charge. For the complete schedule of events go here:
https://friendsofcreamersfield.org

Yampa Valley Crane Festival (10th Annual)
Dates: Thursday, September 2 – Sunday, September 5, 2021
Location: Steamboat Springs and Hayden, Colorado

Greater Sandhill Cranes are an iconic species of the Yampa Valley and Northwest Colorado. In 2012, the Colorado Crane Conservation Coalition, Inc. sponsored the inaugural Yampa Valley Crane Festival. Colorado Crane Conservation Coalition is dedicated to the conservation and protection of Greater Sandhill Cranes in Colorado. The festival seeks to educate the public about cranes and to

emphasize conservation of the special habitat that supports the cranes and the many other species of birds and wildlife in Northwest Colorado.

Festival organizers are thrilled to announce that the 2021 keynote speaker on Saturday, September 4 will be Dr. Richard Beilfuss, President and CEO of the International Crane Foundation. Dr. Beilfuss's talk, *Cranes: Ambassadors for Conservation*, will focus on the emerging challenges that cranes around the world face, including the impact of climate change on the wetlands and water that cranes and people need to thrive.
Check back for more information about the virtual festival and educational videos at coloradocranes.org

Whooping Crane and Nature Festival
Date: Saturday September 11, 2021
Location: Princeton Public School (604 Old Green Lake Road, Princeton WI 54968)
Princeton, Wisconsin

Head out to Princeton, Wisconsin, for the Whooping Crane and Nature Festival on September 9, 2021. Enjoy a fun-packed day of family-friendly festivities, including guest speakers, craft fair, music and delicious food! Explore White River Marsh State Wildlife Area and celebrate our ongoing efforts to save the Endangered Whooping Crane from extinction. Click here to learn more.

Cranes of the World Grand Opening Celebration
Date: Saturday, September 18, 2021
9:00 am – 5:00 pm
Location: International Crane Foundation Headquarters
E11376 Shady Lane Rd
Baraboo, WI

It's time to celebrate – crane style – the opening of our site *Cranes of the World*. Join us as we give thanks for our wonderful new visitor experience and YOU for making it a reality!
Make a day of it while enjoying over 10 acres of new exhibits and experiences, including the all-new George Archibald Welcome Center with an expanded gift shop. Make time to hike our birdwatching and nature trails. Events will include family-friendly fun, ribbon-cutting and tours of the new exhibits.
https://www.savingcranes.org/event/cranes-of-the-world-grand-opening-celebration/?instance_id=2388

Greater Yellowstone Crane Festival (4th Annual)
Dates: September 13 – September 18, 2021
Location: Driggs, Idaho/Teton Valley

The Greater Yellowstone Crane Festival is held to celebrate the annual migration of Sandhill Cranes through Teton Valley and supports the efforts of the Greater Yellowstone Sandhill Crane Initiative which works to protect crucial habitat and resources for the largest staging population of Sandhill Cranes in the Greater Yellowstone and the myriad of iconic species that call the region home.
For more information go to: www.tetonlandtrust.org

International Crane Foundation Member Appreciation Day
Date: October 16, 2021, 9:00 a.m. – 5:00 p.m.
Location: International Crane Foundation Headquarters
E11376 Shady Lane Rd
Baraboo WI 53913
Your membership makes a difference for cranes worldwide, and we want to thank you for your support. Please join us for this fun-filled day with behind-the-scenes tours, special programs, and lectures – dedicated to you! Not a member? Join the flock today. *Updates will be posted on the ICF website:* https://www.savingcranes.org

Jasper-Pulaski Fish & Wildlife Area
Location: Jasper-Pulaski Fish & Wildlife Area, 5822 N. Fish and Wildlife Lane,
Medaryville (just off US 421, about 15 miles north of Monon) Indiana

Best viewing times: Sunrise, as the flocks rise and fly out of roosting marshes, and about one hour before sunset, as the flocks return to Goose Pasture. There is a great observation deck that enables visitors to witness the comings and goings.

Typically, the area hosts tens of thousands of Sandhill Cranes each year as the sandhills "stage" at the 8,142-acre Jasper-Pulaski Fish & Wildlife Area during Fall migration – from late September through December. The FWA presents an opportunity for them to not only forage but roost on their journey southward. In the past, there have been reports of such rarities as the Common Crane and Whooping Crane mixed in with the thousands of Sandhills.

Sunset with the Sandhill Cranes
Date: Thursday October 7, 2021
Time: 5:30 p.m. CDT
Location: Navarino Nature Center
W5646 Lindsten Road, Shiocton, WI 54170
RSVP Tickets required. (Fee: $5 NNC members, $10 individuals, $15 families)
For updates, go here: https://www.navarino.org/events/sunset-with-the-sandhill-cranes

The Navarino State Wildlife Area (WDNR) is located in southeastern Shawano County and northeastern Waupaca County, and consists of 15,000 acres of wetlands, forests, prairies and agricultural fields. Guided hike in the Hazelwood viewing deck on Pike's Peak Flowage to watch hundreds to thousands of Sandhill cranes come into roost for the night. Bring your binoculars or camera for some great photos. Staff will have binoculars to borrow if needed. 1/2 mile walk back to the viewing deck, where you can ask questions and learn about crane habits and biology.

Cranefest
Dates: October 9 – October 10, 2021
Noon until Dusk
Location: Kiwanis Youth Conservation Area
22300 15 Mile Rd, Bellevue MI

CraneFest was formed to raise awareness and appreciation of our natural heritage and to support the ongoing educational and conservation efforts of Michigan Audubon as they apply to the Bernard W. Baker Sanctuary. Michigan Audubon, in partnership with the Kiwanis Club of Battle Creek, has organized this Sandhill Crane and art festival since 1994The Kiwanis Club of Battle Creek invites you to enjoy a day outdoors. Witness the annual fall migration of thousands of Sandhill Cranes when these majestic birds leave their favorite feeding fields at dusk and head to Big Marsh Lake.

The CraneFest event is now owned by the Kiwanis Club of Battle Creek. If you would like more information about the event or if you have questions, please contact the Kiwanis Club of Battle Creek through their Facebook page or by email at kiwanis.battlecreek@gmail.com.

VIRTUAL
24th Sandhill Crane Festival (Lodi Sandhill Crane Festival)
Due to continuing uncertainties of the pandemic, leaders of the Lodi Sandhill Crane Association (LSCA) will be celebrating the cranes virtually in 2021.
Dates: November 5-7, 2021
125 S.Hutchins Street Lodi, CA 95240

For the latest Crane Festival news, information about the cranes, and crane-viewing sites, go here: https://lodisandhillcrane.org If you would like to become part of the Lodi Sandhill Crane "family," check out LSCA membership opportunities. The Association is volunteer-driven, and member support is critical to continued work by LSCA that benefits the Sandhill Cranes and the Delta habitat the cranes depend on.

VIRTUAL
Crane Fiesta 2021
Date: TBD

Bosque del Apache NWR, New Mexico

Crane Fiesta 2021 will be a mix of virtual media with live webinars and other virtual events. Festival favorites such as the Expo tent, photography and birding webinars, and the Wildlife Zone.
For more information go to the festival website:
http://www.friendsofbosquedelapache.org/festival-of-the-cranes.aspx
or check back here for updates:
https://friendsofbosqudeapace.org/crane-fiesta/

Holiday with the Cranes on Galveston Island
Dates: December 11-12, 2021
Location: Galveston Island, TX

Holiday with the Cranes is presented by the Galveston Island Nature Tourism Council, a nonprofit volunteer organization that helps connect people with nature experiences and outdoor adventures and promotes the value of natural habitats and resources in the Galveston Island area.
Closer to the festival date, check here for more festival information including the festival itinerary, and to register for fieldtrips please go here: https://www.galvestonnaturetourism.org/holiday-with-the-cranes/

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Specializing in Winter Hummingbird banding
www.southeasternavianresearch.org
The Tennessee Ornithological Society
www.tnbirds.org
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For archived issues of the *Eastern Crane Bulletin* click here:
http://kyc4sandhillcranes.com/eastern-crane-bulletin/

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